MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2016 / 2017

TAS 3491 – ADVANCED SOFTWARE ENGINEERING

(All sections / Groups)

7 MARCH 2017
9:00 A.M. – 11:00 A.M.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 5 pages (including cover page) with 7 Questions only.
2. Attempt **ANY FIVE** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please print all your answers in the Answer Booklet provided.

Question 1 (10 marks)

a) Explain the basic characteristics of the Unified process.

[2 marks]

b) The Unified Process is defined as a two dimensional system development process. Sketch the diagram to illustrate this.

[5 marks]

c) Describe ANY THREE primary workflows in the Unified Process.

[3 marks]

Question 2 (10 marks)

a) Describe ANY THREE benefits of using formal specifications to document software requirements.

[3 marks]

b) Write suitable English sentences to show the meaning of the following predicate logic:

$$\forall x\,(\mathbf{walk}(x) \rightarrow \mathbf{calm}(x))$$

[2 marks]

c) Write a Z schema for an **Indicator** with three values: *light, reading* and *danger_level*. *light* can be 'on' or 'off, whereas *reading* and *danger_level* are positive integers. Note that the value of light is 'on' when *reading* is less than or equal to *danger_level*.

[5 marks]

Continued ...

Question 3 (10 marks)

a) Describe the following principles of component-based development:

- Reusability
- Substitutability
- Extensibility
- Composability

[4 marks]

b) Given the following components for a ticketing kiosk system:

Component	Provided interfaces	Required interfaces
Kiosk		Sales
Ticket Seller	Sales	Purchase Charge
Ticket	Purchase	
Credit Card	Charge	

Draw the component diagram to illustrate these components and their relationships.

[6 marks]

Question 4 (10 marks)

a) Describe the *Content Model* used in requirements analysis when developing Web applications.

[3 marks]

b) Explain ANY THREE design goals for Web applications.

[3 marks]

c) Describe the testing process for Web applications, stating the major tests to be conducted in the process.

[4 marks]

Continued...

Question 5 (10 marks)

MyTuition is a tuition centre based in Puchong that provides tuition classes for primary and secondary school students. It runs its business at a three-storey shop lot where the administration is done at the ground floor and the tuition classes are conducted at the upper floors.

The management of the tuition centre would like to develop a computer-based system to support the following processes:

- Registration of new students
- Registration of students to classes
- Payment of fees
- Display timetables
- Record attendances in classes

The system is implemented through a few networked computers at the ground floor of the tuition centre and in the classrooms at the upper floors.

a) Describe, in detail, how this system can be implemented using a 3-tier architecture.

[6 marks]

b) Briefly describe the following technologies:

- DCOM
- J2EE Architecture

[4 marks]

Continued...

Question 6 (10 marks)

MyPhone Sdn Bhd is a telecommunications company that is developing i-Messager, an integrated messaging system that is meant to allow its users to send emails, text messages, multimedia messages, and various types of messages through mobile phones.

(a) Give THREE reasons for using design patterns to develop this software.

[3 marks]

(b) Explain why a *Factory* design pattern would be suitable for this application.

[2 marks]

(c) Draw the class model that implements the *Factory* design pattern for this application.

[5 marks]

Question 7 (10 marks)

a) Briefly describe the Manifesto for Agile Software Development.

[4 marks]

b) You are appointed to be the Project Manager for a new project using Extreme Programming methodology. Describe the main activities in planning phase of the project.

[4 marks]

c) Explain the concept of "pair programming" in Extreme Programming.

[2 marks]

End of Page